

FEMA's *Project Impact*

Natural Disasters: Think! Act! Prevent!

Overview

Floods, hurricanes, wildfires, tornadoes, and earthquakes are dynamic natural forces that have shaped the Earth for millions of years. We call them natural disasters because of the suffering, loss of life, and property damage they cause: Floods destroy towns and drown people and animals; hurricanes batter coastal properties, displacing people; fast-moving wildfires consume forests and neighborhoods; tornadoes flatten everything in their paths; and earthquakes fracture structures. In some natural disasters, people have advance warning; others take people by surprise.

Technology allows us to track hurricanes and tornadoes, measure earthquakes, predict flooding, and battle wildfires. Science cannot prevent disasters, but there are actions people can take to mitigate (lessen) the effects on lives and property.

Using information from the Federal Emergency Management Agency (FEMA), through its initiative *Project Impact: Building Disaster Resistant Communities*, the first three activities in this lesson plan help you and your students learn ways to prevent natural disaster damage at home and in schools and communities. In the fourth activity, students use the enclosed "Presidential Disaster Declarations" map to discover the prevalence of particular natural disasters in different parts of the United States.

Grade Level

Grades 6 - 8 (may be adapted for other grades)

Curriculum Connections

Geography, social studies, science, language arts

Starting Out

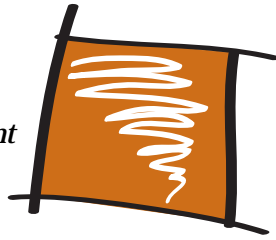
Materials: Copies of the "Student Page" (page four of this lesson plan); "Presidential Disaster Declarations" map. Print out the "Things to Know" lists for tornadoes at www.fema.gov/kids/knw_tor.htm; and for earthquakes at www.fema.gov/kids/knw_eq.htm

- Write "natural disasters" on the chalkboard and list wildfire, tornado, flooding, earthquake, and hurricane. Explain that "natural" refers to forces of nature. Ask: What disasters are not "natural?" (wars, airplane crashes, oil spills)
- Ask students if anyone has first-hand experience with one of these natural disasters. How was the real-life disaster different from a natural disaster seen on the news or in a movie?
- Discuss some of the impacts of natural disasters on people's lives and property — injury and death, damage to roads and bridges, loss of electrical and telephone service, damage to water and sewage systems and gas lines and resulting pollution. Point out that there are emotional as well as long-term economic effects.
- Distribute the "Student Page" and "Things to Know" print-outs. Tell students to keep the pages to use with Activities 1 and 4. Ask them to share the "Things to Know" print-outs and "Resources" list with their families. Have volunteers read aloud the poems on the "Student Page." Access the FEMA for Kids web site (www.fema.gov/kids/k2k.htm) for more firsthand accounts by children who experienced natural disasters.



Activity 1: Home Remedies

Materials: Copies of the “Student Page” and “Things to Know” print-outs



Exploration

Discuss “prevention” in connection with natural disasters. Explain that prevention means things people can do to reduce the risk of disaster damage at home, at school, and in the community.

- Discuss why every family needs a disaster plan and ask students for ideas about what it should entail, such as what to do and where to go if asked to evacuate (leave their home).
- Assign groups of students to discuss each of the following at-home prevention strategies.

Floods: Keep valuables and appliances out of the basement. Have the main breaker or fuse box and the utility meters raised above the flood level for your area. Buy flood insurance. (To learn more, have your parent call 1-800-427-4661.)

Hurricanes and Tornadoes: Use storm shutters to protect windows and glass, and hurricane straps to attach the roof to the walls.

Earthquakes: Bolt or strap cupboards and bookcases to the walls, and keep heavy objects on the lower shelves. Have your home bolted to its foundation.

Wildfires: Clear dead brush and grass from your property. Keep trees around your home free of dead or dying wood or moss. Put tile or flame-retardant shingles on your roof.

Students can learn more on the FEMA for Kids web site (www.fema.gov/kids/ready.htm) or in a free FEMA brochure about family disaster preparedness. (Call 1-800-480-2520; specify publication L-191.)

- Ask students to discuss natural disaster prevention with their families. Include: What types of disasters might happen locally? (www.fema.gov/maps) What should we do to prepare? (www.fema.gov/kids/ready.htm)
- Share the following information with students. Remind them to use the resources listed on the “Student Page” to learn more.

Focus on Tornadoes and Earthquakes

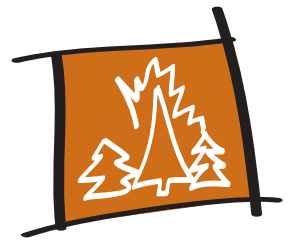
Tornadoes are nature’s most violent storms. They originate in powerful thunderstorms and appear as rotating, funnel-shaped clouds, with winds that can reach 300 mph. Tornadoes can damage an area as large as one mile wide and 50 miles long. Every state is at some risk, but states in “Tornado Alley” (Texas, Oklahoma, and Kansas) are at highest risk. Tornadoes can form any time of year, but the season runs from March to August. Usually a community will have at least a few minutes warning before being hit.

Earthquakes are an unpredictable shaking, rolling, or sudden shock caused by the underground movement of the earth’s crust. They typically last less than one minute, and can be felt over large areas.

- Discuss with students the “Things to Know” print-outs.

Activity 2: Safety at School

Materials: notebooks; drawing materials; rulers; “Presidential Disaster Declarations” map



Exploration

- Because they are public buildings, schools are often chosen as places of refuge for evacuees. Find out if your school has ever been used as such a refuge, or if there are plans to use it as a refuge during a future emergency. In a natural disaster, students may be kept at school instead of being sent home through dangerous conditions.
- Assign teams of three or four students to explore the resources of your school as a refuge and answer these questions: What is the school policy about evacuation during a natural disaster? Is there a basement for refuge? How would power outages affect people with disabilities? Is it possible to get to a windowless area during a tornado? Are there animals that would need to be evacuated?
- Prepare a map of the school showing location of restrooms, cafeteria, gymnasium, library, and exits. The map could be duplicated for use by community members if the school were used as a shelter during a future natural disaster.

- Use the enclosed “Presidential Disaster Declarations” map to locate areas of the country likely to experience hurricanes or wildfires. Discuss: What makes a building vulnerable to these disasters? What building materials mitigate their impact?
- Share the following information with students.

Focus on Hurricanes and Wildfires

Hurricanes are severe tropical storms that form in the southern Atlantic Ocean, Caribbean Sea, Gulf of Mexico, and in the eastern Pacific Ocean. They gather heat and energy through contact with warm ocean waters. Winds of at least 74 miles per hour rotate in a counter-clockwise direction around a calm area in the middle called the “eye.” Intense rain, winds, and waves threaten lives and property.

Wildfires are uncontrolled outdoor fires that ignite and consume everything in their paths. Lightning, accident, or arson can cause them. Wildfires move rapidly and can burn millions of acres. They threaten people who live in or near prairies or wooded areas. If you are told to evacuate - go!

Activity 3: Community Checklist

Materials: “Presidential Disaster Declarations” map; directory of local officials; telephone directory; word processing software

Exploration

- All communities are vulnerable to some kind of natural disaster and need disaster plans.
- Divide students into groups to answer the following questions and report the answers back to the class: Has your community ever experienced a natural disaster? If so, when? What were the effects? Could your community experience more in the future?
- To find out about your community, visit the FEMA web site at www.fema.gov and go to the “Maps” section. Choose “Interactive Hazard Map” and then “On-line Hazard Map.” Follow the prompts to learn about natural disasters close to home.
- Determine which local officials to interview about natural disaster prevention. Possibilities include: the mayor; police and fire chiefs; the director of public works; managers of voluntary organizations, such as the Red Cross; and hospital administrators.



- Compose a list of questions for representatives of your class to ask these public officials about local natural disaster prevention. Explain that your class is preparing a Community Checklist for people to follow in the event of a natural disaster. Ask for information to include.
- The questions might be posed in person, by phone, e-mail, or letter. Include: What are the current emergency plans for the area? Are there plans for getting older or infirm people in the community to a shelter? Where should people with four-wheel-drive vehicles go to volunteer to help? What lessons were learned from past natural disasters?
- When the class has gathered information from local officials and from the FEMA for Kids web site, create the Community Checklist. Illustrate it and make copies to donate to local libraries, government offices, and the local newspaper.
- Share the following information with students.

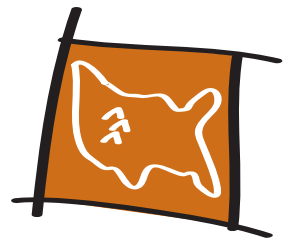
Focus on Floods

Discuss what makes a community vulnerable to flooding, keeping in mind that it can happen in any US state or territory. Flooding happens when rivers overflow during heavy rains, when ocean waves come onshore during extra-high tides or hurricanes, when snow melts too fast, or when dams or levees break.

Activity 4: Interpreting Maps

Materials: “Presidential Disaster Declarations” map

- Distribute color copies of the “Presidential Disaster Declarations” map or have students refer to the enclosed map.
- Explain that FEMA helps people who have been in a disaster and teaches them what to do before, during, and after a disaster. FEMA has divided the country into ten regions, shown on the map.
- Define “Presidential Disaster Declaration” as a first step in providing immediate government assistance to areas hit by a disaster.
- Have students answer questions under “Working with the Map” on the “Student Page.” **Answers: 3. I, III, VII, VIII, X; 4. IX, X; 5. IX; X**



STUDENT PAGE

Home Is Where the Flood Lives

by Amanda

This is the flood.
Where nobody lives.
This is where the Red River lives.
This is where a fire burned
Down parts of Grand Forks.
And you can hear the rising water.
And you can see the rising water.
And you can feel the rising water.
And everybody cares.

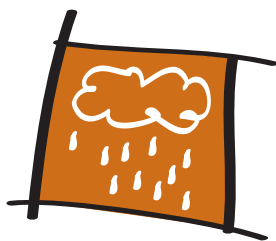
Flood

by Toby

Flowing
Lost pets
Over dams
Overwhelmed
Disaster

Working with the Map

1. Identify the other states in your FEMA region.
2. In your region, which disaster occupies the biggest part of the pie chart? the smallest?
3. In which regions did declarations relating to floods equal more than half of all declarations? (check pie charts)
4. Which FEMA regions have had disaster declarations related to wildfires?
5. Which FEMA regions have had disaster declarations related to earthquakes?
6. Make up a question based on the map and challenge other students to find the answer.



Web Resources

Federal Emergency Management Agency
www.fema.gov and www.fema.gov/kids
(A complete list of related web sites can be found on the FEMA for Kids site: www.fema.gov/kids.)

National Geographic Society
www.nationalgeographic.com

National Oceanic Atmospheric Administration
www.noaa.gov

National Weather Service Homepage
www.nws.noaa.gov

United States Geological Survey
www.usgs.gov

Other Resources

Restless Earth: Nature's Awesome Powers,
National Geographic Society, 1997.

Raging Forces: Earth in Upheaval,
National Geographic Society, 1995.

NATIONAL GEOGRAPHIC Magazine, July 1998,
"Living with Natural Hazards," by Michael Parfit,
pages 2-39.

Geography Standards

I. The World in Spatial Terms

1. Maps and other geographic tools for information in a spatial perspective.

III. Physical Systems

7. Physical processes shape patterns of Earth's surface.

V. Environment and Society

14. Human actions modify the physical environment.
15. Physical systems affect human systems.